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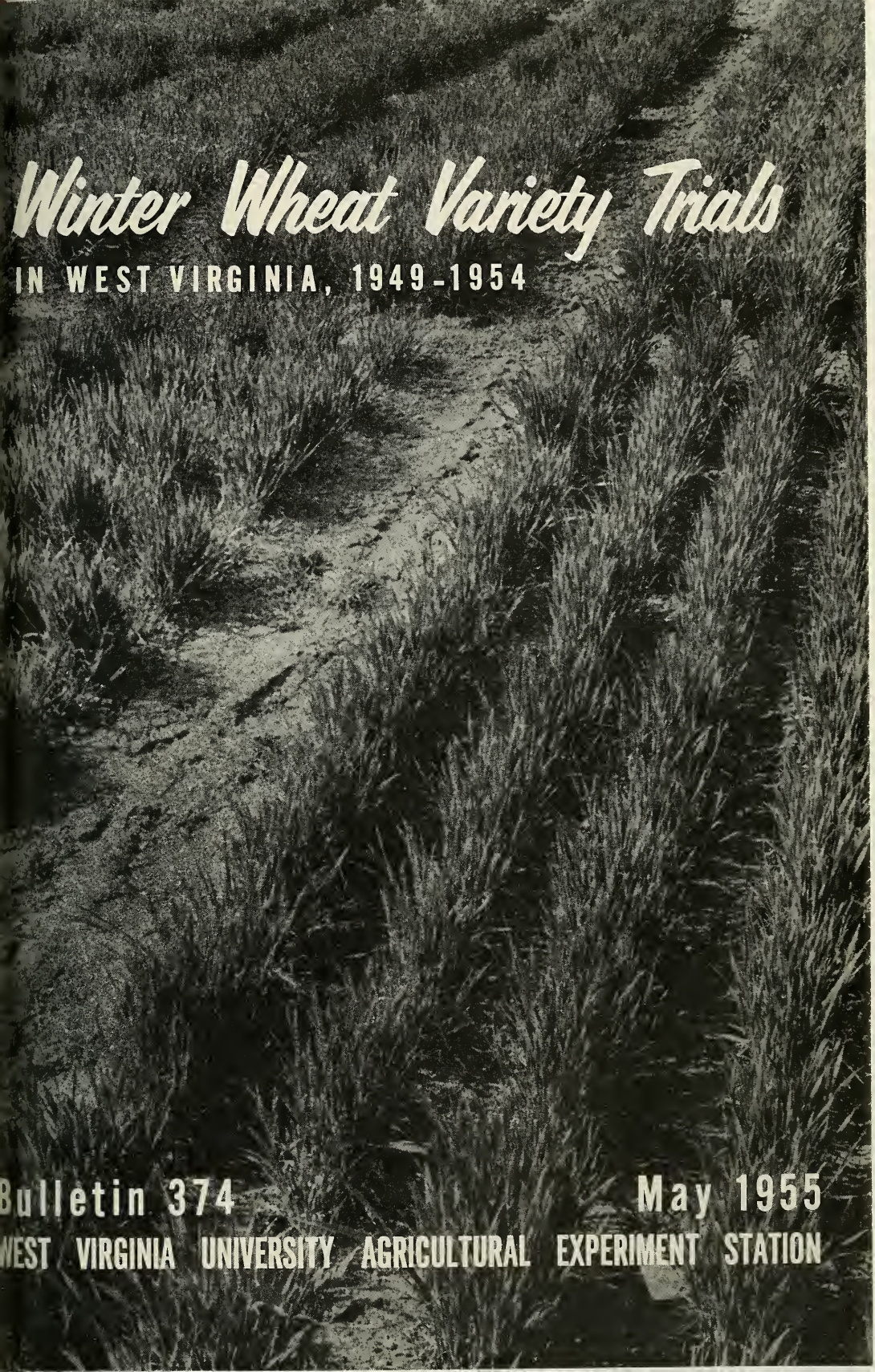

Winter Wheat Variety Trials

IN WEST VIRGINIA, 1949-1954

Bulletin 374 May 1955

WEST VIRGINIA UNIVERSITY AGRICULTURAL EXPERIMENT STATION

Summary

Soft red winter wheat variety trials grown near Point Pleasant, Morgantown, Reedsville, Wardensville, and Kearneysville, from 1949-1954 are reported in the accompanying tables.

The varieties available have given excellent results, but there is room for improvement in disease resistance, strength of straw, and quality of grain. Nured is primarily a feed wheat.

On the basis of these variety trials the available varieties would be listed in order of preference, at the indicated locations, as shown below.

VARIETY RECOMMENDATIONS

Pt. Pleasant	Morgantown	Reedsville	Wardensville	Kearneysville
Butler	Seneca	Seneca	Seneca	Thorne
Seneca	Butler	Nured	Nured	Butler
Thorne	Thorne	Butler	Butler	Nured
		Thorne	Thorne	Seneca

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Winter Wheat Variety Trials in West Virginia, 1949-1954

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Introduction

THE value of variety trials conducted by the West Virginia University Agricultural Experiment Station is largely dependent upon the widespread dissemination of such information among the farmers. The primary purpose of this bulletin is to present a summary of the winter wheat variety trials that have been conducted at various locations in West Virginia over the six-year period from 1949 through 1954.

Importance of Winter Wheat in West Virginia

In acreage and value of grain produced, winter wheat is second only to corn in West Virginia. Winter wheat is grown in West Virginia primarily as a feed crop, although in a few areas it is grown as a cash grain crop. It fits well into the common rotation of corn, small grain, and legume-grass hay. The soft red winter wheats grown in this State are winter hardy and usually serve as companion crops to the grass and legumes seeded on the same areas. They give a good winter cover, and if planted early in the fall, and properly managed, they may provide some fall grazing for livestock.

Varieties

New varieties of wheat are being developed and must be tested in comparison with older varieties to determine their adaptability and possible superiority. The presence of diseases, and the numerous races of disease organisms, complicate the problem of developing high-yielding, disease-resistant varieties.

Standard varieties and local selections were included in these variety trials. Strains that have yielded well in the Uniform Soft Winter Wheat Nursery, grown at Morgantown, were included in the trials.

The varieties and selections grown in these trials are briefly described in Table 1. A more detailed description of the named varieties may be found in U.S.D.A. Farmers Bulletin No. 2006, *Wheat Production in the Eastern United States,* and U.S.D.A. Technical Bulletin No. 1083, *Classification of Wheat Varieties Grown in the United States in 1949.*

The following varieties have been tested at one time or another in these trials but have all been discontinued since they did not measure up to Thorne in yield or other desirable characteristics during the time they were under test: American Banner, Canawa, Fairfield, Fulcaster, Fulhio, Hardired, Kawvale, Leapland, Leaps Prolific, Nittany, Hedhart, Vahart, V.P.I. 131, and Yorkwin.

Methods

The wheat yields reported in Tables 2 through 6 are based on randomized rod row trials with four replications, each replication consisting of three-row plots of each variety and selection. Sixteen feet of the center row of each 18-foot plot was harvested for yield after removal of a border of one foot from each end.

These trials were conducted at the various Agricultural Experiment Stations on the soil types and at the elevations indicated below.

Location	Soil Type	Elevation
Point Pleasant	Wheeling sandy loam	700 feet
Morgantown	Rayne silt loam	1,200 feet
Reedsville	Monongahela silt loam	1,800 feet
Kearneysville	Emory silt loam	500 feet
Wardensville	Monongahela silt loam	950 feet

Fertilizer was usually applied at the rate of 300 pounds of 3-12-6 per acre.

The wheat varieties are grouped in the tables in order of yield, according to the number of years they were included in the trials. Annual variety yields are given for all years in which the variety was grown. Average yields are also shown for various periods of time as indicated in the individual tables. Not all of the varieties grown in the trials previous to 1954 are shown in the tables. Some of the lower-yielding varieties were discontinued and other strains or varieties were added to the trials. The number of varieties included in each year's trial is given. The average yields and least significant differences (L.S.D.'s) were calculated by using all of the varieties in the trial and not just those shown in the tables.

The L.S.D.'s at the 5 per cent level are given for the annual and the average yields.

The comparable average yield was calculated (see Table 2 footnote) in order to have a comparison of the yield of varieties though they may not have been included in the trials for the whole period.

Discussion of Results

The producer is primarily interested in production as measured by yield. Yield is a measure of varietal response of a plant population to environmental conditions. It is dependent upon the vigor of the plant, the ability of the plant to utilize available nutrients, and resistance to disease, as well as many other plant characteristics.

In comparing the yields of the various wheat varieties recorded in the accompanying tables, it should be kept in mind that unless the difference in yield between two varieties is greater than the least significant difference (L.S.D.) the difference cannot necessarily be attributed to varietal characteristics. Such differences would be attributed to soil variation or other environmental factors.

POINT PLEASANT TRIALS

The Ohio Valley winter wheat variety trials (Table 2) were grown at Lakin until the Experiment Station farm was relocated near Point Pleasant in 1951 in time to seed the 1952 crop. At Lakin the wheat was grown in a rotation following tobacco. The tobacco was well fertilized, but no additional fertilizer was applied to the wheat. The low yields in 1950 and 1951 at Lakin were attributed to unfavorable weather rather than to low fertility.

Butler was the highest-yielding variety when the trials were grown at Lakin. It was not ranked quite as high at Point Pleasant. This apparent loss in position of Butler may be attributed to the addition of improved strains to the trials. The improved strains from Indiana and Ohio (TN) have not been released for increase.

The comparable average yield would rank the varieties as follows: TN-1259, Butler, Sel. 1-45-145, Wardensville Sel. #1, Kentucky 35, Thorne, Seneca.

MORGANTOWN TRIALS

The yields of wheat at Morgantown (Table 3) were higher than at the other locations, ranging from an average of 19.75 bushels in 1949 to 37.43 bushels per acre in 1951.

The comparable average yields would rank the varieties in the following order: TN-1232, Seneca, TN-1259, Butler, Wardensville Sel. #1, Kentucky 35, and Thorne.

Based on the six-year average yield, Seneca, Butler, and Thorne would be ranked in that order. These three varieties are consistently among the top-yielding varieties and were not significantly different in average yield.

Some selections were included in the 1953 and 1954 trials that gave higher yields than Seneca but they are still well within the least significant difference (L.S.D.).

REEDSVILLE TRIALS

Wheat trials were not seeded at Reedsville in the fall of 1953, so yields are not reported for 1954. The plot was too dry and hard to prepare a proper seedbed at the time when the wheat should have been seeded.

The 1949 yields were so low, averaging 8.95 bushel per acre, that it is questionable whether or not they should be given consideration in a variety comparison.

On the basis of comparable average yield the varieties would be ranked as follows: Nured, Wardensville Sel. #1, Seneca, Butler, and Thorne.

Nured has consistently given slightly higher yields at Reedsville in comparison with Seneca, Butler, and Thorne. Nured was developed in New York and is recommended primarily for feed, since it apparently does not have desirable milling qualities.

WARDENSVILLE TRIALS

The yields secured in the trials at Wardensville (Table 5) would indicate that some of the seasons were not favorable for wheat production. The 1950 yields were exceptionally low, averaging only 8.5 bushels per acre. The highest yield obtained was that of TN-1232 in 1953. The 1949 yields were reported on the basis of one replication due to excessive lodging as a result of heavy rains at harvest time.

Of the varieties tested, Thorne and Nured gave the highest yields over the six-year period. Seneca was included in the trials in 1950 and has been one of the best producers tested.

On the basis of comparable average yield the best varieties would be ranked as follows: TN-1232, TN-1259, Seneca, Kentucky 35, Butler, Thorne, and Nured.

In the 1954 trial Indiana Selection C.I. 12985 outyielded all other strains except TN-1232.

KEARNEYSVILLE TRIALS

The average yield at Kearneysville for 1950 (Table 6), as at Wardensville, indicates that unfavorable conditions seriously reduced yields. The 1949 yields were not included in this table since Thorne was the only variety grown in 1949 that has been grown continuously since then.

The comparable average yields indicate the highest-yielding varieties in the following order: TN-1259, Thorne, Butler, Nured, TN-1232, and Kentucky 35. Seneca has not given as good results, comparatively, at Kearneysville as at other locations.

On the basis of these trials the available varieties for the Kearneysville area would be ranked as follows: Thorne, Butler, Nured, Seneca, and Vigo.

Table 1. Descriptions of Soft Red Winter Wheat Varieties.

Variety	C.I. No.	State of Origin	Parentage	Physical Characteristics			Disease Resistance to
				Chaff		Heads	
Butler	12527	Ohio	OSU, 101-3 x Trumbull	white	purple	bearded	scab, mosaic, smuts
Nured	12455	New York	Forward x Dietz	white	purple	awnletted	mosaic, some loose smuts
Seneca	12529	Ohio	Portage x Fulcaster	brown	yellow	beardless	loose smut, mosaic, leaf rust
Stoner	4862		Fultz x Lancaster	white	purple	bearded	mosaic, some mildew
Thorne	11856	Ohio	Portage x Fulcaster	brown	yellow	beardless	loose smut, mosaic, leaf rust
Vigo	12220	Indiana	Trumbull x Fultz	white	yellow	beardless	leaf rust, mosaic, loose smut
Kentucky No. 35	12659	Kentucky	(Frondosa x Trumbull) x (Hope x Hussar)	white	purple	beardless	leaf rusts, stem rusts
Pennoll	12755	Penn.	Valprize x Nittany	white	yellow	awnletted	leaf rust
TN-1232	12673	Ohio	Thorne x (Ohio 9220-Dawson)	white	purple	beardless	leaf rust
TN-1259	12990	Ohio	OSU, 101-3 x Thorne	white	purple	beardless	
Indiana Selection	12557	Indiana	Pur. 7 x (Trumbull-(Hope-Hussar)Fultz	white	purple	beardless	
Indiana Selection	12985	Indiana	W38-Fultz sel.-Hungarian-Wabash-Fairfield	white	purple	beardless	mildew, leaf rust
Indiana Selection	13083	Indiana	Hope x Hussar	white		beardless	leaf rust
Sel. 1-45-145		W.Va.	———	white	yellow	bearded	mildew
Wardensville 1		W.Va.	———	white	yellow	beardless	
Wardensville 8		W.Va.	———	brown		bearded	

Table 2. Average and Annual Yields of Winter Wheat at Point Pleasant 1949-1954.

Variety	C.I. No.	Average Yields (bu./A.)				Comparable* Aver. Yield	Yield in bushels per Acre					
		2 yr. 53-54	3 yr. 52-54	5 yr. 50-54	6 yr. 49-54		1949	1950	1951	1952	1953	1954
Butler	12527	33.65	28.80	22.82	22.53	20.53	21.1	9.8	17.9	19.1	35.4	31.9
Sel. 1-45-145		27.65	25.73	20.52	21.73	19.80	27.8	9.5	15.9	21.9	31.4	23.9
Thorne	11856	30.90	27.53	21.26	20.78	18.94	18.4	7.5	16.2	20.8	31.1	30.7
Seneca	12529	32.65	27.90	20.72	20.48	18.66	19.3	7.4	12.5	18.4	32.6	32.7
Nured	12455	26.45	24.40	19.72	19.27	17.56	17.0	8.6	16.8	20.3	31.9	21.0
Wards. Sel. No. 8		29.85	25.37	19.44		17.83		5.5	15.6	16.4	36.4	23.3
Stoner		24.85	23.50	18.72		17.17		7.7	15.4	20.8	32.5	17.2
Wards. Sel. No. 1		32.70	28.63			19.73				20.5	36.0	29.4
Vigo	12220	28.35	25.97			17.43	16.3	8.4		21.2	29.5	27.2
Ky. 35	12659	32.25				19.23					36.2	28.3
TN-1259	12990	34.75				20.72					40.4	29.1
TN-1232	12673	29.10				17.35					31.0	27.2
Ind. Selection	13085											36.0
Ind. Selection	12575											32.4
Ind. Selection	12985											30.9
Pennoll	12755											22.6
No. varieties in trials							14	21	25	20	12	16
Av. Annual Yield							20.74	7.34	12.76	18.31	33.71	27.71
L.S.D. .05		7.03	4.66	3.10	2.65		7.06	2.35	3.92	6.05	7.39	8.10

*The *comparable average yield* was calculated by adding the annual yields of a variety and dividing this by the sum of the average yields of all varieties for the same years. This gave the percentage rating. The average yield of all varieties for the entire period was multiplied by the percentage rating obtained for the variety; this gave the comparable average yield of the variety.

Table 3. Average and Annual Yields of Winter Wheat Grown at Morgantown 1949-1954.

Variety	C.I. No.	Average Yields (bu./A.)			Comparable* Aver. Yield	Yield in bushels per Acre					
		2 yr. 53-54	3 yr. 52-54	6 yr. 49-54		1949	1950	1951	1952	1953	1954
Seneca	12529	34.85	37.57	34.18	33.52	23.5	26.8	42.1	43.0	32.8	36.9
Butler	12527	37.20	34.87	31.98	31.37	20.6	25.2	41.5	30.2	38.9	35.5
Thorne	11856	31.85	32.33	30.27	29.63	20.8	21.1	42.4	33.3	31.0	32.7
Sel. No. 1		32.50	32.33		29.21				32.0	24.0	41.0
Sel. 1-45-145		33.15	32.30		29.18				30.6	28.0	38.3
Stoner		29.25	31.43		28.40				35.8	30.0	28.5
Vigo	12220	29.45	30.70		27.73				33.2	26.9	32.0
Nured	12455	28.60	28.87		26.08				29.4	21.6	35.6
Sel. No. 8		26.60	27.07		24.45				28.0	22.0	31.2
TN-1232	12673	39.30			33.68		25.2	43.9		43.6	35.0
TN-1259	12990	36.40			31.95					41.0	31.8
Kentucky 35	12659	31.90			31.76		32.0	43.5		26.9	36.9
Ind. Selection	13085										39.4
Ind. Selection	12575										36.2
Pennoll	12755										33.5
Ind. Selection	12985										29.9
No. varieties in trials						27	34	33	20	12	16
Av. Annual Yield						19.75	22.86	37.43	29.82	30.56	34.63
L.S.D. .05		6.57	5.19	4.47		4.48	6.89	6.82	6.37	9.29	8.96

*See Table 2.

Table 4. Average and Annual Yields of Winter Wheat Grown at Reedsville 1949-1953.

Variety	C.I. No.	Average Yields (bu./A.)				Comparable* Aver. Yield	Yield in Bushels per Acre				
		2 yr. 52-53	3 yr. 51-53	4 yr. 50-53	5 yr. 49-53		1949	1950	1951	1952	1953
Nured	12455	25.10	25.07	24.08	20.82	21.87	7.8	21.1	25.0	27.4	22.8
Butler	12527	22.85	22.60	22.33	19.68	20.67	9.1	21.5	22.1	26.4	19.3
Thorne	11856	22.40	23.03	22.23	19.42	20.40	8.2	19.8	24.3	27.1	17.7
Vigo	12220	20.95	20.83	19.90	17.58	18.47	8.3	17.1	20.6	21.9	20.0
Seneca	12529	25.15	25.30	22.65		21.00		14.7	25.6	27.0	23.3
Stoner		19.75	20.77	20.88		19.36		21.2	22.8	20.6	18.9
Wards. Sel. No. 8		21.25	21.47			19.20			21.9	23.9	18.6
Sel. 1-45-145		19.55	20.70			18.51			23.0	20.5	18.6
Wards. Sel. No. 1		23.65				21.54				24.8	22.5
Ky 35	12659										24.9
TN-1259	12990										23.5
TN-1232	12673										22.7
No. varieties in trials							12	21	25	20	12
Av. Annual Yield							8.95	19.27	23.25	23.05	21.05
L.S.D. .05		1.56	2.12	2.25	2.95		3.5	4.91	5.90	5.14	5.37

*See note on Table 2.

Table 5. Average and Annual Yields of Winter Wheat Grown at Wardensville 1949-1954.

Variety	C.I. No.	Average Yields (bu./A.) 2 yr. 53-54	3 yr. 52-54	5 yr. 50-54	6 yr. 49-54	Comparable* Aver. Yield	Annual Yields (bu. per Acre) 1949†	1950	1951	1952	1953	1954
Thorne	11856	19.85	20.43	19.08	19.93	19.32	24.2	7.8	26.3	21.6	26.1	13.6
Nured	12455	21.05	22.97	20.20	19.55	18.95	16.3	7.4	24.7	26.8	23.8	18.3
Wards. Sel. No. 8		16.20	19.60	17.72	18.10	17.54	20.0	8.2	21.6	26.4	19.3	13.1
Wards. Sel. No. 1		18.65	18.77	16.10	17.05	16.52	21.8	8.5	15.7	19.0	25.5	11.8
Seneca	12529	22.35	24.37	21.02		20.74		10.2	21.8	28.4	26.5	18.2
Butler	12527	22.50	22.97			19.70				23.9	29.0	16.0
Vigo	12220	17.40	20.17			17.30				25.7	21.1	13.7
Sel. 1-45-145		17.85	19.77			16.95				23.6	21.8	13.9
Stoner		12.70	17.03			14.61				25.7	14.5	10.9
TN-1232	12673	24.60				22.52					29.5	19.7
TN-1259	12990	23.80				21.79					32.1	15.5
Ky 35	12659	21.55				19.73					28.7	14.4
Ind. Selection	12985											19.3
Pennoll	12755											14.9
Ind. Selection	12575											14.7
Ind. Selection	13083											14.2
No. varieties in trials							24	25	25	20	12	16
Av. Annual Yield							20.55	8.50	20.22	24.02	23.84	15.12
L.S.D. .05		4.93	3.69	1.96				3.08	5.30	4.96	7.33	5.64

*See Note on Table 2.

†Only one replication harvested due to wet weather.

Table 6. Average and Annual Yields of Winter Wheat Grown at Kearneysville 1950-1954.

Variety	C.I. No.	Average Yields (bu./A.)				Comparable* Aver. Yield	Annual Yields (bu. per Acre)				
		2 yr. 53-54	3 yr. 52-54	4 yr. 51-54	5 yr. 50-54		1950	1951	1952	1953	1954†
Thorne	11856	29.50	27.13	28.75	26.66	26.61	18.3	33.6	22.4	24.5	34.5
Butler	12527	28.20	26.07	29.60	26.08	26.03	12.0	40.2	21.8	26.2	30.2
Seneca	12529	27.70	23.67	25.33	23.62	23.58	16.8	30.3	15.6	30.5	24.9
Wards. Sel. No. 1		25.70	23.43	23.00	21.44	21.40	15.2	21.7	18.9	26.4	25.0
Vigo	12220	29.30	25.93	26.80		24.18		29.4	19.2	26.5	32.1
Nured	12455	29.50	27.07			25.37			22.2	29.4	29.6
Sel. 1-45-145		26.35	25.03			23.47	11.5		22.4	23.9	28.8
Wards. Sel. No. 8		23.35	21.50			20.16			17.8	25.9	20.8
Stoner		24.95	21.23			19.91			13.8	26.9	23.0
TN-1259	12990	35.05				29.07				31.8	38.3
TN-1232	12673	30.55				25.34				27.6	33.5
Ky 35	12659	30.45				25.26				27.7	33.2
Pennoll	12755										39.3
Ind. Selection	12575										36.4
Ind. Selection	12985										34.8
Ind. Selection	13083										30.9
No. varieties in trials							12	14	20	12	16
Av. Annual Yield							13.91	29.77	19.04	27.28	30.93
L.S.D. .05		4.27	4.18	3.53	5.43		4.47	9.16	5.63	4.17	12.76

*See Table 2.
†Only two replications.